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## Detection of irrigation events on maize plots using sentinel-1 soil moisture products

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An accurate knowledge of irrigation timing and rate is essential to compute the water balance of irrigated plots. However, at the plot scale irrigation is a data essentially known by the irrigator. These data do not go up to higher management scales, thus limiting both the management of water resources on a regional scale and the development of irrigation decision support tools at the farm scale. The study focuses on 6 experimental plots in the south-west of France. The new method consists in assessing surface soil moisture (SSM) change between observations and a water balance model. The approach was tested using both in situ measurements and surface soil moisture (SSM) maps derived from Sentinel-1 radar data. The score is obtained by assessing if the irrigation event is detected within +/- three days. The use of in situ SSM showed that: (1) the best revisit time between two SSM observations is 3 days; short gaps is subject to uncertainties while longer gap miss possible SSM variations; (2) in general, higher rates (>20mm) of irrigation are well identified while it is very difficult to identify irrigation event when it is raining or when irrigation rates are small (<10mm). When using the SSM microwave product, the performances are degraded but are still acceptable given the discontinuity of irrigation events: 34% of absolute error and a bias of 5% for the whole season. Although high vegetation cover degrades the SSM absolute estimates, the dynamic appeared to be in accordance with in-situ measurements.